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# Identifying Opportunities for Collaboration Across the Social Sciences to Reach the 10-10-10: A Multilevel Approach

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**Background:** The national and global strategy to combat HIV, often referred to as the “90-90-90,” aims to diagnose 90% of people living with HIV, get 90% of those diagnosed onto antiretroviral treatment (ART), and achieve viral suppression in 90% of those on ART. The remaining 10-10-10 who will be undiagnosed, not on ART, or not virally suppressed, include vulnerable persons and populations most affected by social determinants of health. Given their foci on the social determinants of health at the individual, social, and structural levels, social scientists are in a prime position to help reach the 10-10-10. A potentially effective way for social scientists to achieve this goal is to examine the issues that affect the 10-10-10 using a multilevel framework, to understand at what levels their own approaches fit within such a multilevel framework, and to seek intentional collaborations with other social scientists who may work at different levels but whose approaches may complement their own within multilevel collaborations.

**Approach:** The present article describes how a multilevel framework can guide collaboration across disciplines within the social sciences toward the common goal of reaching the 10-10-10.

**Conclusions:** Within a multilevel framework, social scientists can work collaboratively to address the needs of individuals among the 10-10-10 within the social and structural contexts (eg, social norms, stigma, poverty, and barriers to care) that affect their health. Such an

approach draws on the unique strengths and approaches of different social-science disciplines while also building capacity for individuals most affected by social determinants of health.

**Key Words:** HIV, social sciences, social determinants of health, multilevel frameworks, interdisciplinary collaboration

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## INTRODUCTION

It has been over 35 years since the start of the HIV and AIDS epidemic, and the social and behavioral sciences have made important contributions to HIV prevention and care throughout the history of the epidemic. For example, the Centers for Disease Control and Prevention lists a number of “effective behavioral interventions” that have been developed by social scientists and are frequently used or adapted by community-based organizations and clinical settings to prevent HIV infection, promote HIV testing among populations at high risk of infection, or engage those living with HIV into care.<sup>1</sup> Although we have come far, we still have work to do. More specifically, health disparities have taken center stage such that HIV is still a major issue among particularly vulnerable populations. The national and global HIV prevention and care targets, often referred to as “90-90-90,” focus on the goals of diagnosing 90% of people living with HIV, getting 90% of those diagnosed onto antiretroviral treatment (ART), and achieving viral suppression in 90% of those on ART.<sup>2</sup> The remaining “10-10-10” represents those individuals living with HIV who will remain undiagnosed, not on ART, and not virally suppressed, even when we reach our 90-90-90 goals. The 10-10-10 likely includes the individuals living with HIV who are most vulnerable (eg, the more socially marginalized, including men who have sex with men or transgender women, people who are homeless or unstably housed, injection drug users, and racial minorities) and are adversely affected by disparities related to social determinants of health. These social determinants of health can be understood as the conditions in the environment in which people live, work, learn, and play that can affect their health outcomes directly or indirectly through increased (or decreased) risk factors.<sup>3,4</sup> These conditions in the environment include, but are not limited to, poverty, lack of access to health care, having a marginalized social identity, having (or lacking) a sense of community, patterns of discrimination and

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incarceration, or experiencing a disproportionate amount of crime and violence.<sup>3,4</sup> In addition, the 10-10-10 may not be easily reached by HIV prevention and treatment efforts that do not specifically identify and respond to their unique needs.

Social scientists engaged in HIV-related research, with their tendency to focus on social determinants of health, are primed to help reach the 10-10-10. Biomedical approaches benefit from collaborations with the social sciences,<sup>5</sup> and there are many ways in which social scientists can collaborate to advance the science and curb the epidemic. For HIV science to continue to make progress in reaching our goals, we need a strong social science-informed research agenda to guide us forward, and collaboration is central to realizing such an agenda. Poundstone<sup>6</sup> (ie, socioepidemiological framework of HIV) and Krieger<sup>7,8</sup> (ie, the ecosocial approach to health) have explicated multilevel frameworks that can help to guide the conscious development of interdisciplinary and collaborative approaches to reaching the 10-10-10. Figure 1, adapted from Poundstone,<sup>6</sup> illustrates one way in which multidisciplinary approaches could be combined across individual, social, and structural levels of study and intervention. Collaborating across the rungs of an ecological, multilevel framework can help social scientists optimize and complement the strengths of each discipline. This is especially true against a backdrop of limited funds for research, which needs to be maximized for impact.

The present article highlights our perspectives on collaboration across the social sciences through the lenses of 4 disciplines that will serve as examples: social epidemiology, anthropology, behavioral economics, and clinical psychology. The following sections first briefly introduce each discipline and then illustrate how these social-science disciplines might work together to address specific needs of people from populations who might be reflected among the 10-10-10.

## SOCIAL EPIDEMIOLOGY

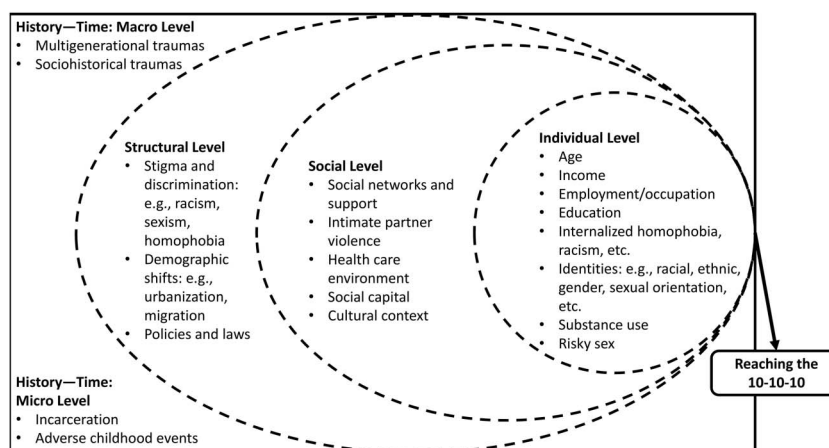
Social epidemiology is defined as the study of the social determinants of disease and focuses on how both social structures and institutions and social conditions, interactions, and relationships influence health outcomes and health disparities.<sup>9,10</sup> From the social epidemiological perspective, communities included in the last 10-10-10 are most likely

impacted by social determinants, including racism, poverty, and social marginalization. Those upstream social determinants impact the social fabric and social capital of communities, with fewer economic resources, racism, and social exclusion leading to what William Julius Wilson,<sup>11</sup> a noted sociologist, called “social disorganization,” or a lack of a sense of community or positive neighborhood identification. Depletion of community resources, including social capital and social cohesion that help reinforce positive norms and bring resources to the community,<sup>12</sup> can ultimately translate into poor health outcomes through any number of pathways: lack of access to care, poor quality care and services, increased violence in the community, increased stress, and finally, riskier individual behaviors.<sup>13–15</sup> In the context of HIV, inhabitants of these same communities may be less likely to receive high-quality health care, could experience more social barriers accessing health facilities and may be less adherent to treatment.<sup>6</sup>

The great benefit of a social epidemiological lens, focusing not on individual behaviors but on social structures and relationships that ultimately shape individual health behaviors, is the possibility of identifying those mutable aspects of the social environment so they can subsequently be addressed, with the potential to improve a host of health outcomes, not only HIV. Although interventions targeting social and structural change can be costly and difficult to study in traditional randomized designs, a number of advances in HIV prevention have been made.<sup>16–18</sup> For example, interventions that seek to improve social or community resources to address HIV, including those that aim to increase social capital, mobilize communities, and modify risky community norms, have demonstrated some successes in improving behaviors and health outcomes both in geographic communities<sup>19–22</sup> and in identity-based communities.<sup>23–26</sup>

Despite challenges in trying to change upstream factors, the understanding that social determinants and social resources impact health is no longer in question. What remains less defined is how to best address social structures and processes in HIV prevention and care programs and interventions. This implies greater emphasis on mobilizing communities, accounting for disparities in health care and treatment outcomes, addressing poverty and racism, and integrating community networks and dynamics into biomedical,

**FIGURE 1.** Adapted from Poundstone et al.<sup>6</sup> An example of a multilevel, socio-ecological framework that may help to guide collaboration between social scientists in their efforts to reach, understand, and develop interventions for the 10-10-10.



psychosocial, and behavioral interventions.<sup>27,28</sup> Advances will require interdisciplinary partnerships. The discipline of social epidemiology will continue to benefit from advances in individually focused fields, such as neurology and clinical psychology, in understanding how the environment gets “under the skin” and, therefore, how these pathways can be interrupted. Simultaneously, social epidemiologists should continue to work closely with policy makers and those influencing the societal structures and community programming that can impact social determinants.

## ANTHROPOLOGY

Anthropology focuses on the ways in which the social environment structures human interactions and behaviors. In recent years, it has also accounted for the social and economic dynamics that may limit or open up opportunities for health-seeking behaviors and change. Using an array of ethnographic approaches that may include participant observation, in-depth interviews, and even quantitative surveys, anthropologists (along with sociologists) typically invest substantial time with their subjects, becoming embedded in communities and gaining a deep understanding of the social dynamics that drive and organize behavior. Data are often triangulated to produce textured “thick descriptions” of a particular community and its practices.<sup>29</sup> For example, using ethnography, Marlon Bailey’s and Emily Arnold’s studies with house-ball communities uncovered the longstanding and gendered forms of HIV-related social support that could be mobilized to promote HIV-related health and prevention among social networks of sexual and gender minority youth of color in Detroit and Oakland.<sup>30,31</sup> Anthropologists have also made theoretical contributions to our understanding of global HIV-related health disparities, tracing political and economic forces to an individual agency in settings characterized by poverty and strained health care systems.<sup>32,33</sup>

Social network analysis hones in on relationships between individuals and the social ties that span communities. Investigations centered on the flows of information, behavior, and material goods are also a hallmark of social network analysis. In the field of HIV, multiple interventions have been fielded that build on the strength of social networks. These include popular opinion leader models,<sup>34</sup> as well as network-related interventions that incorporate social media and technology as a way to identify the entire network and its key players to diffuse HIV-related behavior change, such as pre-exposure prophylaxis uptake.<sup>35</sup> Working with house-ball community-involved youth in Oakland, HIV-related social support within the network was significantly associated with regular HIV testing and fewer episodes of condomless anal intercourse, prompting additional intervention development work.<sup>36</sup> Successful social network-related interventions rely on identifying individuals who can span the network, and who are influential within their communities to promote safer sexual or injection practices.<sup>37–39</sup> These individuals then become the backbone of interventions, creating more sustainable health promotion practices in communities over time.

Theoretically, ethnographic and social network-based research work at overlapping and conjoined layers of the

ecological framework. Both approaches attend to social relationships between actors, whereas ethnography also considers structural-level factors such as the social, political, and economic contexts that free or constrain human behavior and opportunities for change. Given this attention to the more structural and social layers of the ecological framework, the work of ethnographers and social network researchers toward meeting the needs of people at risk of or affected by HIV would benefit most from collaborating with scientists working on behavioral factors that operate at the individual level, such as psychologists. In addition, those who examine issues at the structural level, such as policy and legal environments, could also contribute substantially to ethnographic and social network-driven research, to identify not only social factors but also structural-level factors that impact our ability to engage with those in the 10-10-10 and improve outcomes along the continuum.

## BEHAVIORAL ECONOMICS

Behavioral economics incorporates insights from psychology into economics to understand systematic departures from the homo economicus model of neoclassical economics. This fusion is reflected in the following terms from behavioral economics:

### Bounded Rationality

Humans have limited brainpower and face constraints to accessing all available information. For example, behavioral economists have found that peoples’ preference for a smaller good in the near-term relative to a delayed, larger good can depend on the time at which the choice is made. People who engage in HIV risk behaviors often face this type of intertemporal choice between an investment now (such as costly pre-exposure prophylaxis or ART) and uncertain benefits that are spread out over time.

### Bounded Willpower

Even if people manage to pick an optimal choice, they often have a hard time following through on their choice because of limited willpower. Humans delay doing strenuous tasks such as adhering to a medication regime and engage in activities that are currently pleasurable but may result in health deterioration in the future.

### Bounded Selfishness

The neoclassical model predicts that people only act in their own self-interest. Yet, individuals frequently give money to charity, help strangers, or contribute to public goods in other ways.

Linnemayr<sup>40</sup> points out 2 key behavioral biases that are likely to arise because of these limitations that can have a negative effect on HIV-related behaviors: First, the salience of HIV may be low as HIV is largely a disease that often cannot be inferred from an infected person’s appearance. Therefore, it is easier to push aside precautionary ideas during

a sexual encounter as the sexual partner who may be HIV-positive is likely not to show any disease symptoms. Contributing to the low salience of HIV may be its chronic, long-term nature, which results in even initially highly motivated people over time “forgetting” about the importance of HIV prevention as more pressing concerns of daily life take over a person’s mental list of priorities.

Present bias may prove particularly damaging for chronic conditions such as HIV/AIDS, where the benefits of a healthier and longer life occur in the distant future, but the costs of consistently adhering to prevention or ART are incurred daily.<sup>40</sup> Incentives when appropriately designed have been shown to be able to counter this bias: Linnemayr et al<sup>41</sup> find that individuals receiving small, nonmonetary lottery incentives were 23.7 percentage points more likely to achieve 90% adherence compared with the control group.

Behavioral economics has provided insights predominantly at the individual and structural level. As such, it lends itself as a bridge between structurally focused fields such as social epidemiology and individual-focused fields such as psychology. A growing subfield of behavioral economics studies social determinants and as such can benefit from increased interaction with sociologists, for example. Although behavioral economics is inherently multidisciplinary in its approach, it can learn from the incorporation of qualitative methods, which to date have not found entry into the discipline and which promise to be a highly productive new line of research.

## CLINICAL PSYCHOLOGY

Psychology, in broad terms, is the study of human behavior. Throughout the HIV epidemic, psychologists have contributed to the design, implementation, and assessment of HIV prevention, care, and treatment strategies that integrate and address behavioral and mental health. The field of psychology has played an important role in HIV from identifying at-risk behaviors and populations to identifying and operationalizing behavioral change, to developing and evaluating behavioral interventions, and to recognizing the role of individuals as well as community, policy, and global perspectives and influences.<sup>42</sup>

Mental health is a critical risk and resilience factor in reaching the 10-10-10. Recently, growing awareness of the impact of trauma has inspired new approaches to the provision of HIV care. The psychological sequelae of trauma include poor decision-making, health care avoidance, increased substance use, and increased risk of anxiety and depression. Among people living with HIV, depression is one of the best predictors of HIV medication nonadherence.<sup>43</sup> Understanding conditions such as depression and substance use among people at risk of and living with HIV is critical to designing evidence-based behavioral interventions that address the needs of the most vulnerable populations yet to be reached. Furthermore, psychologists can provide insight into the emotional issues faced by individuals on receiving an HIV diagnosis, such as learning to cope with the uncertainty of living with a chronic illness, decision-making about disclosure, and treatment adherence.

Psychologists are also particularly well trained to conduct research on the initiation and maintenance of behavior change and designing and evaluating behavioral interventions. In recent years, there has been increased recognition of the critical role that behavioral approaches play in optimizing biomedical advancements in HIV prevention and treatment. Although effective biomedical treatments have significantly advanced the science of HIV prevention and treatment, barriers to accessing and adhering to these treatments often center around psychological concerns such as co-occurring mental disorders, substance use, and stigma as well as issues that are less negative in conation, such as a sense of agency and personally or culturally defined preferences. These barriers to access and adherence to treatment disproportionately impact those communities included in the 10-10-10. For example, my research with transgender women has found that previous experiences of stigma in health care settings can be a major barrier to adherence to HIV treatment, although access to gender-affirming health care can facilitate adherence as well as improved health outcomes.<sup>44–46</sup>

Stigma more broadly results in social marginalization, which leads to HIV health disparities. Developing and implementing evidence-based stigma reduction interventions and increasing access to culturally competent care can help to address some of the most pervasive issues that we still face in curbing the HIV epidemic. For example, interventions that leverage community-led empowerment approaches within transgender communities can increase access to gender-affirming HIV prevention, care, and treatment.<sup>47</sup> As a key population within the 10-10-10, transgender women of color in particular can benefit from affirming, empowering, trauma-informed, and community-led behavioral interventions that are integrated with medical services, including gender-affirming hormone therapy.

Although psychology as a discipline typically focuses on individual-level approaches to behavioral change, there is immense diversity within the field of psychology itself. Collaborations between research psychologists and scientists who focus on community-level factors, such as social networks, and structural-level factors, such as economics and policy, that affect issues of access would be highly beneficial to advancing the science. Furthermore, psychologists are well positioned to collaborate on large-scale trials of community-level interventions, partnerships between HIV research and community service organizations, and translation of research findings to community and public policy arenas.

## MULTILEVEL, CROSS-DISCIPLINARY COLLABORATIONS AS A POTENT MEANS OF REACHING THE 10-10-10

As indicated in the previous sections, a critical way forward is through intentional multilevel, interdisciplinary collaborations as illustrated in Figure 1. For example, a clinical psychologist who works with transwomen at the individual level could develop an intervention to address internalized transphobia or HIV stigma (ie, negative attitudes

toward oneself as a transwoman or someone perceived to be at risk of or living with HIV that are learned from the external environment), its depressive or trauma-related sequelae, and HIV testing behavior or linking to care once transwomen are diagnosed with HIV. At the social level, an anthropologist could collaborate with the psychologist to understand social isolation among transwomen and the challenges transwomen face in navigating health care systems to attain testing and treatment, producing an intervention that would be more ecologically valid (ie, meaningful given the ecological contexts of transwomen). A social epidemiologist might add social- or structural-level components to the intervention, such as building community cohesion or social capital, to help to link socially isolated community members to supportive peers and broader networks to help transwomen to educate others about stigma and counter its effects. With a more intensive focus on how people make decisions at the individual level in this example, a behavioral economist might seek to change the decision-making environment through the judicious, strategic use of incentives. The behavioral economist might also engage with other social scientists to develop or calibrate incentives aimed at recruiting community members for multilevel interventions. Of course, no discipline is necessarily or essentially restricted to one or 2 levels in a multilevel framework.

Whether or not social scientists are working at different levels, social scientists often collaborate by bringing expertise in complementary methodologies. For example, social scientists can work with each other on understanding and using methodologies that are either not typical of their own disciplines and/or in which they themselves do not have expertise. A case of this would be a behavioral economist who is focused on quantitative methods working with an anthropologist to understand social meanings that might influence how transwomen respond to a particular incentive offered within an intervention. The examples we have provided are not exhaustive; rather, we seek to highlight opportunities for collaboration.

## CONCLUSIONS

Although community stakeholders in the fight against HIV use the tools and approaches developed by social scientists every day, we must update our research agenda to have a significant impact on the primary, secondary, and tertiary prevention of HIV among the 10-10-10 who may be left behind. Through their combined efforts, social-science disciplines can develop collaborative, large-scale projects together that tackle the challenges presented by addressing social determinants of health in a focused way, capitalizing on the strengths of each discipline. Within a multilevel framework, social scientists can work collaboratively to address the needs and resources of individuals among the 10-10-10 and the social and structural contexts (eg, social norms, transphobia, poverty, lack of access to care) that adversely affect their health, to understand how risk factors at the structural or social level “get under the skin” to affect individuals (eg, internalized HIV stigma and decision-making around health), and to change attitudes and behaviors at the individual level

(eg, beliefs about HIV treatment and HIV testing behavior). As we march toward the daunting task of addressing the needs of the 10-10-10, we as social scientists can join forces in a call to arms against the devastating effects of HIV and the social determinants that place vulnerable populations at risk for HIV and other adverse health outcomes.

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